

Claims

1. A method for producing a corrosion-resistant rare earth metal-based permanent magnet, characterized in that it comprises providing an aqueous treating fluid, which contains a hydrolysis polymerization product of alkyl silicate and fine zinc particles having an average particle diameter of 1 μm to 50 μm and has a pH value of 6 to 8 and a viscosity of 1000 cP or less, applying the fluid on the surface of a rare earth metal-based permanent magnet, and subjecting the resultant magnet to a heat treatment at 250°C to 400°C, to thereby form a corrosion-resistant film containing fine zinc particles dispersed therein.
2. The production method as claimed in Claim 1, characterized in that the fine zinc particles are flaky particles.
3. The production method as claimed in Claim 1, characterized in that the total content of alkyl silicate as the starting raw material and fine zinc particles in the aqueous treating fluid accounts for 40 wt.% to 90 wt.% (where alkyl silicate content is converted to SiO_2 content).
4. The production method as claimed in Claim 1, characterized in that the mixing ratio of alkyl silicate as the starting raw materials and fine zinc particles in the aqueous treating fluid is 1:1 to 1:19 (in weight ratio: where alkyl silicate content is converted to SiO_2 content).
5. The production method as claimed in Claim 1, characterized

in that an organic dispersing agent is added in the aqueous treating fluid.

6. The production method as claimed in Claim 1, characterized in that the film thickness of the corrosion-resistant film containing fine zinc particles dispersed therein is 1 μm to 50 μm .

7. The production method as claimed in Claim 1, characterized in that other fine inorganic particles are additionally dispersed in the corrosion-resistant film containing fine zinc particles dispersed therein.

8. The production method as claimed in Claim 1, characterized in that the aqueous treating fluid is applied to the surface of the rare earth metal-based permanent magnet by a dip spin coating method.

9. The production method as claimed in Claim 8, characterized in that the method is carried out by using an aqueous treating fluid having a viscosity of 300 cP to 600 cP.

10. The production method as claimed in Claim 8, characterized in that the dip spin coating is carried out by supporting plural rare earth metal-based permanent magnets on approximately the outer peripheral edge portion of a turn table which is rotatable around a vertical center axis that is used as the axis of rotation, immersion coating the rare earth metal-based permanent magnets with the aqueous treating fluid by immersing the turn table having the rare earth metal-based permanent magnets supported

thereon in an aqueous treating fluid tank, and after taking out the resulting turn table from the liquid, rotating the turn table to centrifugally cut off the aqueous treating fluid that has adhered in excess to the rare earth metal-based permanent magnets.

11. The production method as claimed in Claim 10, characterized in that the plural rare earth metal-based permanent magnets are supported in approximately a ring-like arrangement on approximately the outer peripheral edge portion of the turn table.

12. The production method as claimed in Claim 10, characterized in that the rare earth metal-based permanent magnets are thin type magnets.

13. The production method as claimed in Claim 12, characterized in that the thin type magnets are supported in such a manner that the widest plane of the thin type magnet is disposed approximately in parallel with the radial direction of the turn table.

14. The production method as claimed in Claim 13, characterized in that, a coating jig is used as such that in case of attaching it on approximately the outer peripheral edge portion of the turn table, each of the thin type magnets is set apart from each other with the widest plane thereof being placed approximately in parallel with the radial direction of the turn table and in approximately a ring-like arrangement.

15. The production method as claimed in Claim 12, characterized in that the thin type magnets are shaped in one of the shapes selected from planar, ring-like, and arc-like shape.

16. The production method as claimed in Claim 14, characterized in that, after completion of a dip spin coating, the coating jig is detached from the turn table while leaving the thin type magnets still set thereon, and the thin type magnets still set on the coating jig are subjected to a heat treatment at an arbitrary place.

17. A rare earth metal-based permanent magnet, characterized by having on the surface thereof a corrosion-resistant film containing fine zinc particles having an average particle diameter of 1 μm to 50 μm being dispersed in the film component using alkyl silicate as the starting raw material.

18. The rare earth metal-based permanent magnet as claimed in Claim 17, characterized in that the corrosion-resistant film contains 50 wt.% to 95 wt.% of fine zinc particles.

19. The rare earth metal-based permanent magnet as claimed in Claim 17, characterized in that zinc is diffused from the surface of the magnet body to the internal part.

20. The rare earth metal-based permanent magnet as claimed in Claim 17, characterized in that it is produced by the production method according to Claim 1.

21. A dip spin coating method for work pieces, characterized in that it comprises supporting plural work pieces on

approximately the outer peripheral edge portion of a turn table which is rotatable around a vertical center axis that is used as the axis of rotation, immersion coating the work pieces with a paint by immersing the turn table having the work pieces supported thereon in a paint tank, and after taking out the resulting turn table from the liquid, rotating the turn table to centrifugally cut off the paint that has adhered in excess to the work pieces.

22. A method for forming a coating film on a work piece, characterized in that it comprises, a coating jig is used as such that in case of attaching it on approximately the outer peripheral edge portion of a turn table which is rotatable around a vertical center axis that is used as the axis of rotation, each of work pieces is set apart from each other in approximately a ring-like arrangement, and it further comprises immersion coating the work pieces with a paint by immersing the turn table on which the coating jig having the work pieces set thereon is attached in a paint tank; taking out the resulting turn table from the liquid and rotating the turn table to centrifugally cut off the paint that has adhered in excess to the work pieces; detaching, from the turn table, the coating jig having the work pieces still set thereon; and if desired, subjecting the work pieces still set on the coating jig to a dry treatment at an arbitrary place.